

UNITED STATES DEPARTMENT OF THE INTERIOR

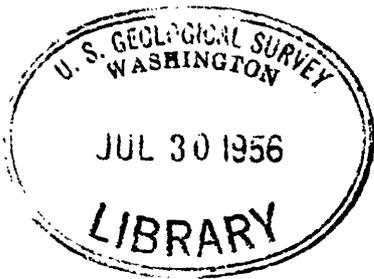
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Tungsten Deposits near Morrissetown, Maricopa County, Arizona

By Gordon L. Bell 1911-

An open file report



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**Tungsten Deposits near Morristory, Maricopa  
County, Arizona**

**By Gordon L. Bell**

**Introduction**

The Morristory tungsten deposits are in T. 7-S N., R. 3 W., in Maricopa and Yavapai Counties, Arizona. The deposits are about 13 miles from Morristory, which is on U. S. Highway 70 and on the Ashfork - Phoenix branch of the Atchison, Topeka and Santa Fe Railroad (fig. 1). The graded highway from Morristory to Castle Hot Springs is followed for slightly more than three miles; a scraped dirt road extends about three and one-half miles northwest from the highway to San Domingo Wash, and the bottom of the wash is followed almost seven miles upstream to the deposits. The area has a relief of about 500 feet. Water may be obtained from wells in the San Domingo Wash.

Vard Johnson of the U. S. Geological Survey visited the district in February 1941 and determined the position of many of the veins by tracing float with an ultra-violet lamp. The deposits were mapped by plane-table methods April 14-21, 1941, by Gordon L. Bell and Jarvis Hadley. The work was under the general supervision of C. B. Hunt of the U. S. Geological Survey. Mr. D. G. McMillan, one of the owners, cooperated by assisting in the field work. Mr. W. D. McMillan of the U. S. Bureau of Mines collected several samples for assay, as part of the investigation.

## Geology

### Exposed Rocks

The rocks of the area include granite, pegmatite dikes, and older pre-Cambrian (?) schist. Most of the pre-Cambrian (?) rocks are hornblendite, hornblende-biotite schist, and tourmalinized quartz-muscovite schist. There are also a few lenses of coarsely crystalline marble. Numerous dikes of monzonite (?) porphyry, basalt, andesite, and rhyolite intrude the granite and schist. The hornblende-biotite schist contains the bodies of tungsten-bearing material.

The widespread pegmatite dikes are characteristically quartz-rich and contain crystals of dark greenish-black tourmaline as much as eight inches in length. Other pegmatite minerals are lithium mica and nearly colorless orthoclase.

Most of the dikes of monzonite (?) porphyry, basalt, andesite, and rhyolite trend roughly parallel with the schistosity. The borders of the dikes are chilled and the wall rocks are slightly altered.

### Structure

The schistosity in the Little San Domingo deposits strikes N. 60° - 70° W., and dips steeply northeast. To the north the direction of minor foliations and schistosity changes, and in the vicinity of Mount Pachan and Mount Vernon the schistosity strikes N. 65° - 80° E., and with minor exceptions dips steeply northwest. Some minor folds in the schist between Mount Pachan and Mount Vernon (fig. 6), trend roughly west and suggest that the major structure is part of a broad fold that also trends west.

No faults with large displacement were observed in the areas mapped, but a normal fault in the canyon west of the Buena Vista deposit, strikes N. 50° W., and dips 50° SW. The fault is covered by alluvium to the northwest, and does not show in the valley to the southwest.

## Ore deposits

Deposits of scheelite are widespread in the hornblende-biotite schist in the Morristown district, and all the known deposits are in the schist. The most northerly deposit, called the Climax, is at Mount Vernon in sec. 35, T. 8 N., R. 3W. The Buena Vista deposit on the south side of Mount Pachan is near the center of the east side of sec. 2, T. 7 N., R. 3 W., and the Little San Domingo deposits are in sections 15, ~~16~~ and 22, T. 7 N., R. 3 W. The schist extends several miles north, east and west from the Little San Domingo deposits, but little prospecting has been done in it.

The tungsten occurs as scheelite, calcium tungstate, and is commonly associated with small amounts of powellite, calcium molybdate, in quartz veins and silicified parts of zones in the hornblende-biotite schist (figs. 2 and 5). These zones are impregnated with epidote, diopside, brown garnet, calcite, chlorite, and actinolite. Small quantities of pyrite, hematite, limonite, chalcopyrite, aurite and malachite are also present in these scheelite-bearing bodies. The zones are from a few inches to several feet in width and length, the limits of the scheelite-bearing parts are indistinct, and the zones conform closely to the schistosity. Some of the scheelite-bearing veins within these zones dip less steeply than the schistosity, but the variations in dip are apparently confined to the zone of alteration.

The scheelite is milky~~white~~ and difficult to distinguish from the milky quartz except with the help of an ultra-violet light.

Quartz veins near the tungsten deposits have been worked on a small scale for gold, and some quartz stringers are in the scheelite-bearing zones (fig. 2). For example, the inclined shaft at the Little San Domingo deposit (fig. 5), was driven to cross~~cut~~ a few quartz stringers.

At the Climax claim the scheelite deposits are in the hornblende-biotite schist that strikes N.  $75^{\circ}$  -  $80^{\circ}$  E. and dips  $60^{\circ}$  -  $70^{\circ}$  NW. The Climax adit (fig. 3), is 5 feet wide and 15 feet long, contains scheelite-bearing veins in the epidote garnet zone, along the hanging wall, in the roof, and on the footwall. In parts of the adit these veins dip less steeply than the schistosity and are cut by barren quartz veins.

An aplite dike cuts the scheelite vein down the ridge from the adit, and a monzonite (?) porphyry dike, up the hill from the adit, apparently cuts the vein (fig. 3). Scheelite float can be traced from the adit to the dike, and from the dike up the hill to the quartz-muscovite schist. Judging by the float, the Climax veins are assumed to persist for 220 feet.

The Buena Vista deposit has been prospected only by two small open cuts (fig. 4). The vein-like scheelite-bearing parts of the schist are from a few inches to three feet wide and float from them can be traced, by means of the ultra-violet lamp, from a few feet to a hundred feet along their strike. Most of the scheelite-bearing veins dip  $60^{\circ}$  -  $70^{\circ}$  NW., similar to the schistosity, but like the Climax deposit some of the veins dip less steeply than the schistosity.

At the Little San Domingo property the workings consist of <sup>seven</sup> ~~one~~ small open cuts <sup>and an inclined shaft</sup> (fig. 5). These prospect the scheelite-bearing zones in the hornblende-biotite schist. Scheelite is present in <sup>Six</sup> ~~some~~ of the small open cuts and the garnet epidote zones can be traced by float for 460 feet along their strike. The width of these zones ranges from a foot to ten feet.

### Reserves

Exploration to April 1941 had not progressed far enough to permit a satisfactory estimate of reserves in the district.

Any attempt to include the deposits of the Morristown district in an inventory of the nation's reserves of tungsten ore should be preceded by enough surface work to test the continuity of the several deposits and to obtain more complete data on the tungsten content.

DIAGRAM OF EAST FACE OF OPEN CUT IN  
LITTLE SAN DOMINGO DEPOSITS

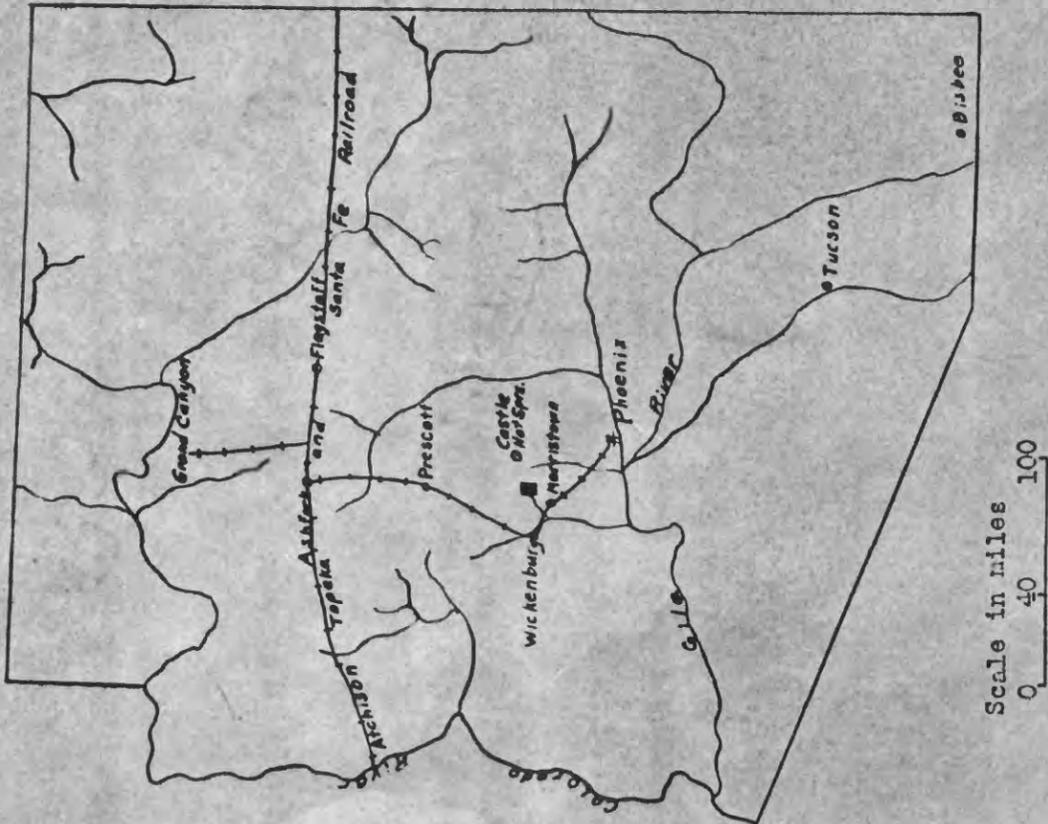
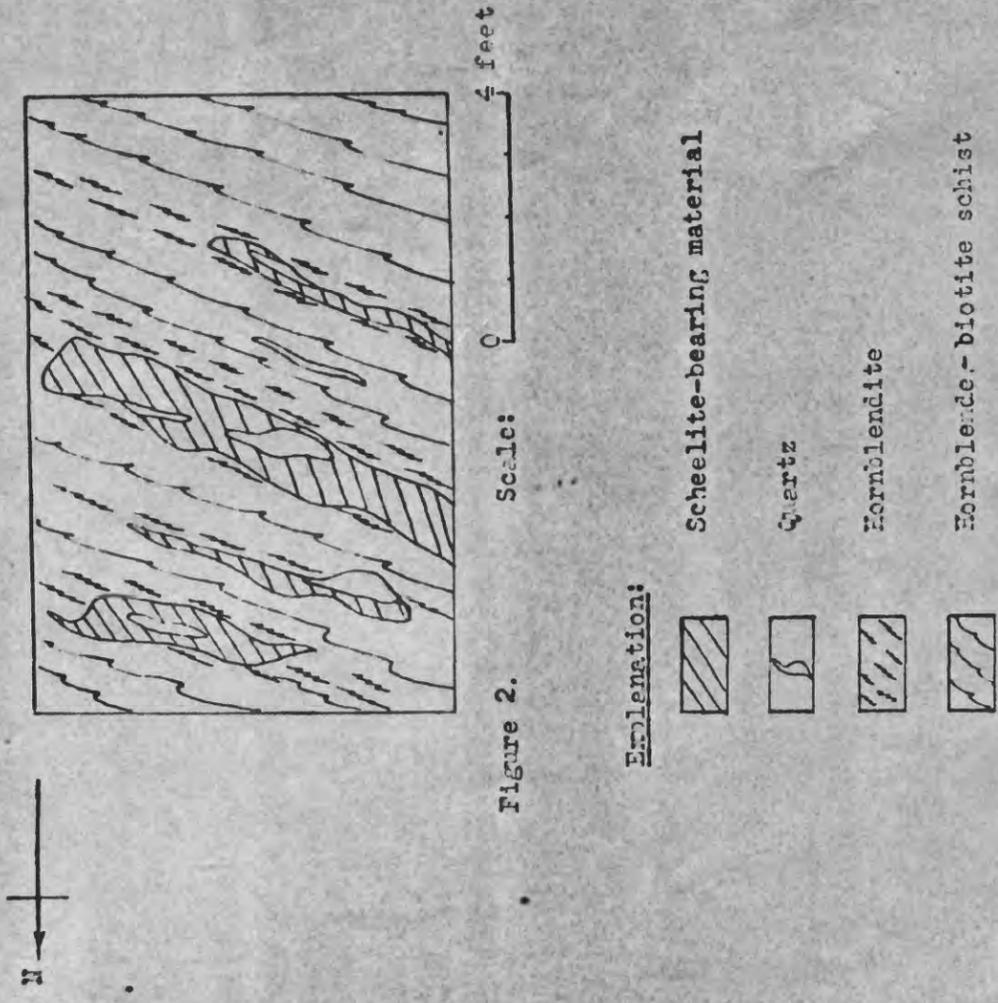


Figure 1 - INDEX MAP OF ARIZONA, SHOWING LOCATION OF MORRISON TUNGSTEN DEPOSITS